

PT0276

- 25 -

C L A I M S

1. A tyre for vehicle wheels comprising: a carcass structure including at least one carcass ply (2), said  
5 carcass structure having two side portions at positions spaced apart from each other in an axial direction, and a crown portion extending in a radially external position between said side portions, at least one annular reinforcing structure associated with said  
10 carcass structure at said side portions, said annular reinforcing structure comprising at least one bead core (10, 11), one tread band (4) at a position radially external to said carcass structure, and a pair of sidewalls (5) at axially opposite positions on said  
15 carcass structure, each carcass ply (2) comprising a plurality of elongated elements disposed in a substantially U-shaped conformation around the cross-section profile of said tyre (1), wherein a fraction of the plurality of said elongated  
20 elements is turned up around said at least one bead core.

2. A tyre as claimed in claim 1, wherein said annular reinforcing structure comprises a first bead core (10)  
25 at an axially internal position and a second bead core (11, 13) at an axially external position relative to said carcass ply (2).

3. A tyre as claimed in claim 2, wherein said fraction  
30 of the plurality of elongated elements is turned up around said axially-external second bead core (11, 13).

4. A tyre as claimed in claim 2, wherein said fraction  
of the plurality of elongated elements is turned  
35 up around said axially-internal first bead core

PT0276

- 26 -

(10).

5. A tyre as claimed in claim 3 or 4, wherein the carcass ply stretch interposed between said first (10) and second (11, 13) bead cores has a cross-section profile of a length (c) included between 15 and 70 mm.

6. A tyre as claimed in claim 2, wherein said annular reinforcing structure comprises a third bead core (12) at an axially external position to said second bead core (11).

7. A tyre as claimed in claim 1, wherein said fraction of the plurality of elongated elements is substantially equal to or lower than 50% of the overall number of said elongated elements.

8. A tyre as claimed in claim 1, wherein the ends of said turned-up elongated elements lie in different planes.

9. A tyre as claimed in claim 1, wherein said tyre (1) has an edge (14) axially and/or radially external to each annular reinforcing structure.

10. A tyre as claimed in claim 1, wherein said elongated elements consist of strip-like elements (6, 6', 7, 7', 7").

11. A tyre as claimed in claim 10, wherein said strip-like elements (6, 6'; 7, 7', 7") are of at least two lengths ( $L_1$ ,  $L_2$ ;  $L_3$ ,  $L_4$ ) different from each other.

12. A tyre as claimed in claim 10, wherein said strip-like elements (7, 7') are of same length ( $L_3$ ).

PT0276

- 27 -

13. A method of manufacturing a tyre for vehicle wheels, said tyre (1) comprising a carcass structure including at least one carcass ply (2), at least one annular reinforcing structure associated with said carcass structure and comprising at least one bead ring (10, 11), one tread band (4) at a radially external position to said carcass structure, and a pair of sidewalls (5) at axially opposite positions on said carcass structure, wherein accomplishment of said carcass structure comprises the steps of:
- preparing a plurality of elongated elements coated with at least one layer of elastomer material;
  - laying each elongated element onto a toroidal support in a substantially U-shaped conformation around the cross-section profile of said toroidal support to define two side portions spaced apart from each other in an axial direction, and a crown portion extending at a radially external position between said side portions;
  - applying said at least one bead core (10, 11) at a region close to said side portions, at least one fraction of said elongated elements having an end at a radially more internal position than said at least one bead core (10, 11);
  - turning up said ends of said fraction around said bead core.

14. A method as claimed in claim 13, wherein said turning-up step is preceded by a step of laying at least one axially internal first bead core (10) and one axially external second bead core (11, 13) relative to said carcass ply (2).

15. A method as claimed in claim 14, wherein said turning-up step is carried out subsequently to the step

PT0276

- 28 -

of laying a layer of reinforced polymeric material at an axially external position to said second bead core (11).

5 16. A method as claimed in claim 14, wherein said turning-up step is carried out around said axially-external second bead core (11, 13).

10 17. A method as claimed in claim 14, wherein said turning-up step is carried out around said axially-internal first bead core (10).

15 18. A method as claimed in claim 16, wherein said turning-up step is carried out in at least two sub-steps separated by a step of laying a filler in an axially external position to the axially external edge of said second bead core (11, 13), the elongated elements turned-up during the second sub-step lying in offset planes relative to the elongated elements turned  
20 up during the first sub-step.

19. A method as claimed in claim 16, wherein the turning-up step is followed by a step of laying a third bead core (12) at an axially external position to said  
25 second bead core (11).

20. A method as claimed in claim 13, wherein said elongated element consisting of a strip-like element (6, 6', 7, 7', 7'') is submitted, during said  
30 preparation step, to a cutting step starting from a continuous ribbon-like element.

21. A method as claimed in claim 20, wherein said cutting step prepares strip-like elements (7, 7') of  
35 the same lengths.

PT0276

- 29 -

22. A method as claimed in claim 20, wherein said cutting step prepares strip-like elements (6, 6'; 7, 7") of different lengths.

5 23. A method as claimed in claim 22, wherein said deposition step is carried out by laying strip-like elements (6, 6') of different length symmetrically with each other relative to the equatorial plane (X-X) of said toroidal support.

10

24. A method as claimed in claim 21, wherein said deposition step is carried out by laying strip like elements (7, 7') of the same length asymmetrically relative to the equatorial plane (X-X)

15 of said toroidal support.

25. A method as claimed in claim 24, wherein said step of laying strip-like elements (7, 7') of same length involves deposition of at least one strip-like element  
20 (7") of smaller length symmetrically relative to said equatorial plane (X-X).

26. A method as claimed in claim 20, wherein said strip-like element (6, 6', 7, 7', 7") during said  
25 preparation step is submitted to a necking-down step.

27. A method as claimed in claim 13, wherein said annular reinforcing structure comprises at least one bead core (10, 11, 12) obtained by a step of winding a  
30 plurality of coils of metal wire disposed in radial superposition and axial side by side relationship with each other.

28. A method as claimed in claim 13, wherein a step of  
35 laying an edge (14) at an axially and/or radially

PT0276

- 30 -

external position to said annular reinforcing structure  
is provided.